

9.7 Least Common Denominator

Construct Meaning

While shopping at a fruit and vegetable stand, Nita and her mother found pineapples that cost \$3 each. Nita selected one pineapple that weighed $\frac{3}{4}$ lb and another that was $\frac{5}{8}$ lb. She thought the pineapple that weighed $\frac{3}{4}$ lb was a better buy. Was she correct?

Fractions with unlike denominators may require renaming only one fraction. For example, is $\frac{3}{4} >$, $<$, or $=$ to $\frac{5}{8}$? Find the least common denominator (LCD).

Find the least common multiple (LCM) of the denominators.

The LCM of 4 and 8 is the LCD for fourths and eighths.

Rename $\frac{3}{4}$ using the LCD.

Compare the fractions using the LCD.

4: 4, **8**, 12, 16

8: **8**, 16, 24

$$\frac{3 \times 2}{4 \times 2} = \frac{6}{8}$$

$$\frac{6}{8} > \frac{5}{8}, \text{ so } \frac{3}{4} > \frac{5}{8}$$

The pineapple that weighs $\frac{3}{4}$ lb is the better buy.

Why was only one fraction renamed to compare $\frac{3}{4}$ and $\frac{5}{8}$?

When you work with fractions that have unlike denominators, more than one fraction may require renaming. Compare $\frac{2}{3}$ and $\frac{3}{5}$. Find the least common denominator.

Multiples of 3: 3, 6, 9, 12, **15** The LCM of 3 and 5 = 15.

Multiples of 5: 5, 10, **15** 15 is the least common denominator.

Rename both fractions, using 15 as the LCD.

$$\frac{2}{3} = \frac{}{15}$$

$$\frac{2 \times 5}{3 \times 5} = \frac{10}{15}$$

Compare the renamed fractions.

$$\frac{3}{5} = \frac{}{15}$$

$$\frac{3 \times 3}{5 \times 3} = \frac{9}{15}$$

$$\frac{10}{15} > \frac{9}{15}, \text{ so } \frac{2}{3} > \frac{3}{5}$$

Check Understanding



Is it necessary to rename both fractions with the LCD? Write "yes" or "no."

a. $\frac{1}{2}$ and $\frac{3}{4}$

b. $\frac{1}{3}$ and $\frac{3}{7}$

c. $\frac{1}{2}$ and $\frac{1}{9}$

d. $\frac{1}{3}$ and $\frac{5}{6}$

e. Rename $1\frac{3}{4}$ and $2\frac{5}{12}$ with the least common denominator.

Practice

Rename the fractions by using the least common denominator.

1. $\frac{1}{2}$ and $\frac{1}{3}$

3. $\frac{2}{3}$ and $\frac{3}{4}$

5. $\frac{1}{2}$ and $\frac{1}{9}$

7. $\frac{1}{4}$ and $\frac{3}{5}$

2. $\frac{2}{5}$ and $\frac{3}{10}$

4. $\frac{3}{5}$ and $\frac{5}{8}$

6. $\frac{2}{3}$ and $\frac{1}{8}$

8. $\frac{1}{6}$ and $\frac{5}{9}$

Rename the mixed numbers by using the least common denominator.

9. $4\frac{1}{2}$ $1\frac{2}{3}$

10. $10\frac{3}{4}$ $5\frac{5}{8}$

11. $2\frac{2}{3}$ $6\frac{5}{6}$

12. $1\frac{2}{5}$ $2\frac{1}{6}$

Write the fraction pair that requires renaming both fractions with the least common denominator.

13. $\frac{1}{4}$ and $\frac{1}{12}$ or $\frac{1}{4}$ and $\frac{1}{9}$

14. $\frac{1}{16}$ and $\frac{1}{3}$ or $\frac{1}{5}$ and $\frac{1}{15}$

Apply

15. Nava lives $\frac{5}{6}$ mile from school, and Ralph's house is $\frac{7}{8}$ mile from the school. Who lives closer to school? How much closer?

16. Palmer's father wanted to purchase a backpack for a long, difficult hiking trip. He saw a pack that weighed $5\frac{3}{5}$ lb and another that weighed $5\frac{7}{10}$ lb. If he purchased the lighter backpack, which one did he buy?

17. On the backpack trip, the hikers needed $2\frac{3}{4}$ cups of water to cook the rice for dinner. One of the men put 2 cups of water in the pot and another gave $\frac{5}{8}$ cup from his water supply. Did they have enough water to prepare the rice? Compare the amount of water they had for the rice with the amount they needed.

18. Do $\frac{3}{4}$ and $\frac{2}{3}$ have more than one common denominator? Why is it important to use the least common denominator for fractions?

